

RESEARCH LABORATORY TECHNICAL REPORT



Disease Resistant Elm Selections

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Many hybrids and selections of Asiatic elm that have reliable resistance to Dutch elm disease (DED) are available for landscape planting. In addition to disease resistance, these elms tolerate urban stress and are adapted to a wide range of soil conditions. These selections are suitable for routine planting in areas where they are adapted to the climate. Descriptions in this report are based primarily on performance of trees growing in the arboretum at the Bartlett Tree Research Laboratories in Charlotte, North Carolina (Zone 8).

Accolade Elm

Ulmus davidiana var. *japonica* 'Morton'

A selection of Japanese elm, Accolade elm exhibits strong resistance to DED and is expected to be resistant to elm yellows. This selection is a favored host of Japanese beetle which can cause defoliation in years with heavy outbreaks. Accolade grows rapidly and has a vase shape with a mature height of 60 feet. It has been planted extensively in many midwestern cities (zone 4). Danada Charm (*Ulmus* 'Morton Red Tip') is an open pollinated selection from Accolade and has similar habit and appearance. Danada Charm does not grow as rapidly as Accolade or Triumph in Charlotte but performs well in zones 4 through 6.

Triumph Elm

Ulmus 'Morton Glossy'

A hybrid between Accolade and Vanguard elm (*U. pumila* x *U. davidiana* var. *japonica*), Triumph elm has similar characteristics to the Accolade parent (Figure 1) and has performed very well at the Bartlett Arboretum. Triumph is not as widely available from wholesale nurseries but can be ordered bare-root from Schmidt Nursery in Oregon. Note: Vanguard, the other parent of Triumph, has a "weedy" growth habit similar to *Ulmus pumila*. Vanguard is not recommended except in Northern Plains states where

Figure 1: Triumph elm



low temperatures and low rainfall limit successful use of other cultivars.

Commendation Elm

Ulmus 'Morton Stalwart'

A hybrid between *U. minor*, *U. pumila* and *U. davidiana* var. *japonica*, Commendation has the fastest growth of any of the Morton Arboretum introductions. This cultivar has an upright, vase shape but has a distinctively wider crown spread than

Accolade or Triumph. The leaves are larger than most hybrid elms and approach the same size as American elm. It has the same resistance to disease as the other Morton introductions as well as the same susceptibility to Japanese beetle feeding.

Homestead Elm

Ulmus ‘Homestead’

Homestead elm is an older cultivar that has been planted for at least twenty years. It has an upright vase form with a finer crown texture than American elm. This cultivar has performed well when planted as a street tree in eastern US cities within zone 6 but has been plagued with canker diseases in zones 4 through 5. Homestead is likely better suited for zones 6 through 8 than colder regions.

Frontier Elm

Ulmus ‘Frontier’

Frontier elm is a hybrid between *U. minor* (smooth leaf European elm) and *U. parvifolia* (Lacebark or Chinese elm). Frontier has an upright-oval form, vigorous growth, and red fall leaf color which is not particularly showy in Charlotte, NC. It has a finer branching habit and smaller leaves than both Accolade and Triumph and is similar to *U. parvifolia*. DED has been confirmed in this selection; however, diseased trees reportedly recovered with minimal branch dieback.

Patriot Elm

Ulmus ‘Patriot’

A complex hybrid between Asiatic and European elms, Patriot has an upright vase form and dark green foliage. The mature height of Patriot elm is expected to be approximately 40 to 50 feet and may be suited to restricted soil volumes of inner cities.

Prospector Elm

Ulmus davidiana var. *japonica** ‘Prospector’

Prospector elm is another selection of Japanese elm that grows rapidly in zone 8. It has a broad, upright form with leaves that are nearly as large as American elm. This is a US National Arboretum introduction. *

Note: *Ulmus wilsoniana* and *U. japonica* (syn. *U. davidiana*) are now considered the same species, *Ulmus davidiana* var. *japonica*.

Chinese or Lacebark Elm

Ulmus parvifolia

All varieties of lacebark elm perform well in the Charlotte region. Lacebark elm is resistant to Dutch elm disease, elm yellows, and Japanese beetles. Japanese maple scale is an occasional problem on trees at the Bartlett Arboretum. Branch failures from snow/ice loading is the primary problem on selections with broad, spreading crowns such as ‘Allee’ and ‘Dynasty’. The following three selections are likely less prone to such branch failures: ‘Bosque’ which has an oval to pyramidal form, ‘Everclear’ which is distinctively fastigiate, and ‘Athena’ which is rounded. Lacebark elm varieties grow rapidly with mature heights expected in the 30-to-50-foot range. Crown texture is much finer and leaf size is much smaller than other elm species and hybrids. Many selections are prized for exfoliating bark characteristics.

American Elm

Ulmus americana

Several cultivars of American elm have documented **tolerance** to Dutch elm disease as opposed to **resistance**, which characterizes the hybrid and Asiatic elms. In resistant elms, disease symptoms do not develop if trees are inoculated with the DED fungus. With tolerant elms, symptoms usually develop when trees are inoculated with the fungus but they usually tolerate the disease and recover. None of the selections of American elm have documented resistance or tolerance to elm yellows. DED-tolerant American elm selections are suitable for planting as specimen feature trees especially on historic sites or for clients who desire this species. These selections are not suited for large-scale street tree plantings such as allees or mass plantings.

‘Valley Forge’ American elm exhibits the best tolerance to DED, but the form and structure is very poor. It is difficult to establish and maintain a central

leader even with annual pruning. ‘New Harmony’ has excellent documented tolerance, but the form is distinctly upright with multiple competing leaders. The crown shape resembles a bunch of celery as opposed to a vase. ‘Princeton’ American elm has documented tolerance to DED, a classic vase shape, and is readily available from commercial nurseries.

‘Jefferson’ elm is a highly desirable, disease-tolerant American elm, but is not readily available from commercial nurseries. ‘Jefferson’ is being grown by Schmidt’s Nursery in Oregon and is available from them as 1” caliper bare root stock. Many ‘Jefferson’ elms that have been distributed to date are actually ‘Princeton’ elms. The University of Minnesota has an excellent website that describes the morphological differences between ‘Jefferson’ and ‘Princeton’ elms: trees.umn.edu/elmid. ‘Liberty’ American elm has been promoted as resistant to DED, but evaluations by USDA showed no difference in disease tolerance between this selection and wild collected elms.



Founded in 1926, The Bartlett Tree Research Laboratories is the research wing of Bartlett Tree Experts. Scientists here develop guidelines for all of the Company’s services. The Lab also houses a state-of-the-art plant diagnostic clinic and provides vital technical support to Bartlett arborists and field staff for the benefit of our clients.